Listing of Claims

Please amend claims 1, 4, 29, 34-36, 38 and 41, and please add new claims 43-48, as shown below. This listing of claims will replace all prior versions and listings of claims in the instant application.

1. (Currently Amended) An antimicrobial sulfonamide derivative, or a salt or a hydrate thereof, comprising:

a core cyclic peptide or core antibiotic of ~~a~~ an acidic lipopeptide antibiotic; and

a lipophilic moiety,

wherein said lipophilic moiety is covalently attached to the core cyclic peptide or core antibiotic *via* a linking chain which includes a sulfonamide linkage and wherein said core cyclic peptide or core antibiotic is not of laspartomycin ~~or polymyxin~~.

2. (Original) The antimicrobial sulfonamide derivative, salt or hydrate of Claim 1 in which the linking chain is a sulfonamide linkage.

3. (Original) The antimicrobial sulfonamide derivative, salt or hydrate of Claim 1 in which the linking chain is a linker that links the core cyclic peptide or core antibiotic to the lipophilic moiety.

4. (Currently Amended) The antimicrobial sulfonamide derivative, salt or hydrate of Claim 1 which is a compound according to structural Formula (I):

(I) $Y\text{-}X\text{-}N(R^4)(\text{-}L\text{-}X\text{-}N(R^1))_m\text{-}R$

wherein:

Y is a lipophilic moiety;

each X is independently selected from the group consisting of ~~-co-SO2-~~ -CO-SO_2-, -CS-, -PO-, -OP(O)-,-OC(O)-, -NHCO and -$N(R^1)$CO- with the proviso that at least one X is ~~-SO2-~~ -SO_2-;

M is 0 or l;

L is a linker;

N is nitrogen;

R^1 and R^4 are each independently selected from the group consisting of hydrogen, (C_1-C_{25}) alkyl optionally substituted with one or more of the same or different R^2 groups, (C_1-C_{25}) heteroalkyl optionally substituted with one or more of the same or different R^2 groups, (C_5-C_{30}) aryl optionally substituted with one or more of the same or different R^2 groups, (C_5-C_{30}) arylaryl optionally substituted with one or more of the same or different R^2 groups, (C_5-C_{30}) biaryl optionally substituted with one or more of the same or different R^2 groups, five to thirty membered heteroaryl optionally substituted with one or more of the same or different R^2 groups, (C_6-C_{30}) arylalkyl optionally substituted with one or more of the same or different R_2 groups and six to thirty membered heteroarylalkyl optionally substituted with one or more of the same or different R_2 groups;

each R^2 is independently selected from the group consisting of -OR^3, -SR^3, -NR^3R^3, -CN, -NO_2, ~~$-N^3$~~ -N_3, -C(O)OR^3, -C(O)NR^3R^3, -C(S)NR^3R^3, -C(NR^3)NR^3R^3, -CHO, -R^3CO, -SO_2R^3, -SOR^3, -$PO(OR^3)_2$, -$PO(OR^3)$, -CO_2H, -SO_3H, -PO_3H, halogen and trihalomethyl;

each R^3 is independently selected from the group consisting of hydrogen, (C_1-C_6) alkyl, (C_5-C_{10}) aryl, five to sixteen membered heteroaryl, (C_6-C_{16}) arylalkyl and six to sixteen membered heteroarylalkyl; and

R is a core cyclic peptide or core antibiotic of ~~a~~ an acidic lipopeptide antibiotic, wherein said core cyclic peptide or core antibiotic is not of laspartomycin ~~or polymyxin~~.

5. (Previously Presented) The antimicrobial sulfonamide derivative of Claim 4 in which R is the core cyclic peptide of zaomycin, crystallomycin, aspartocin, amphomycin, glumamycin, brevistin, cerexin A, cerexin B, Antibiotic A-30912, Antibiotic A-1437, Antibiotic A-54145, Antibiotic A-21978C or tsushimycin.

6. (Previously Presented) The antimicrobial sulfonamide derivative of Claim 4 in which R is the core antibiotic of zaomycin, crystallomycin, aspartocin, amphomycin, glumamycin, brevistin, cerexin A, cerexin B, Antibiotic A-30912, Antibiotic A-1437, Antibiotic A-54145, Antibiotic A-21978C or tsushimycin.

7. (Previously Presented) The antimicrobial sulfonamide derivative of Claim 4 in which R is the core cyclic peptide of aspartocin, Antibiotic A-30912, Antibiotic A-1437, Antibiotic A-54145 or Antibiotic A-21978C.

8. (Previously Presented) The antimicrobial sulfonamide derivative of Claim 4 in which R is the core antibiotic of aspartocin, Antibiotic A-30912, Antibiotic A-1437, Antibiotic A54145 or Antibiotic A-21978C.

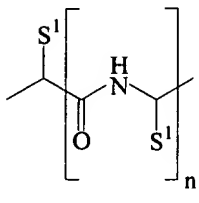
9. (Previously Presented) The antimicrobial sulfonamide derivative of Claim 4 in which R is the core cyclic peptide of aspartocin.

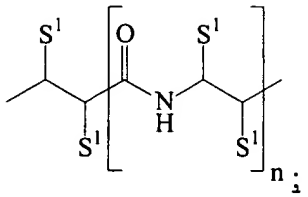
10. (Previously Presented) The antimicrobial sulfonamide derivative of Claim 4 in which R is the core antibiotic of aspartocin.

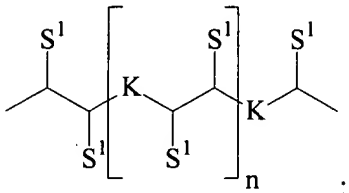
11. (Original) The antimicrobial sulfonamide derivative of Claim 4 in which m is 1.

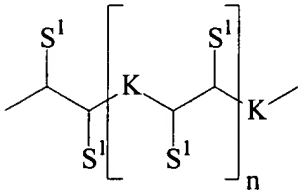
12. (Original) The antimicrobial sulfonamide derivative of Claim 4 in which R^1 and R^4 are hydrogen.

13. (Previously Presented) The antimicrobial sulfonamide derivative of Claim 4 in which L is selected from the group consisting of:

(Ll) 

(L2) 

(L3)  ; and

(L4) 

or a pharmaceutically acceptable salt or hydrate thereof, wherein:

n is 0, 1, 2 or 3;

each S^1 is independently selected from the group consisting of hydrogen, (C_1–C_{10}) alkyl optionally substituted with one or more of the same or different R^5 groups, (C_1-C_{10}) heteroalkyl optionally substituted with one or more of the same or different R^5 groups, (C_5-C_{10}) aryl optionally substituted with one or more of the same or different R^5 groups, (C_5-C_{15}) arylaryl optionally substituted with one or more of the same or different R^5 groups,(C_5-C_{15}) biaryl optionally substituted with one or more of the same or different R^5 groups, five to ten membered heteroaryl optionally substituted with one or more of the same or different R^5 groups, (C_6-C_{16}) arylalkyl optionally substituted with one or more of the same or different R^5 groups and six to sixteen membered heteroarylalkyl optionally substituted with one or more of the same or different R^5 groups;

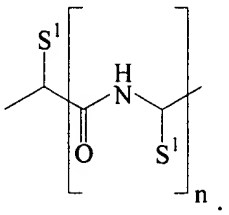
each R^5 is independently selected from the group consisting of $-OR^6$, $-SR^6$, $-NR^6R^6$, -CN, $-NO_2$, $-N_3$, $-C(O)OR^6$, $-C(O)NR^6R^6$, $-C(S)NR^6R^6$, $-C(NR^6)NR^6R^6$, -CHO, $-R^6CO$, $-SO_2R^6$, $-SOR^6$, $-PO(OR^6)_2$, $-PO(OR^6)$, $-CO_2H$, $-SO_3H$, $-PO_3H$, halogen and trihalomethyl;

each R^6 is independently selected from the group consisting of hydrogen, (C_1-C_6) alkyl, (C_5-C_{10}) aryl, five to sixteen membered heteroaryl, (C_6-C_{16}) arylalkyl and six to sixteen membered heteroarylalkyl; and

each K is independently selected from the group consisting of oxygen, nitrogen and sulfur.

14. (Original) The antimicrobial sulfonamide of Claim 13 in which each S^1 is independently a side-chain of a genetically encoded α-amino acid.

15. (Previously Presented) The antimicrobial sulfonamide of Claim 13 in which L is:



16. (Original) The antimicrobial sulfonamide derivative of Claim 15 in which each S^1 is independently a side-chain of a genetically encoded α-amino acid.

17. (Original) The antimicrobial sulfonamide derivative of Claim 15 in which n is 0.

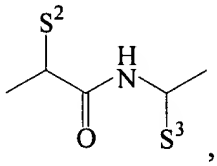
18. (Previously Presented) The antimicrobial sulfonamide derivative of Claim 17 in which S^1 is hydrogen, Y is decan-yl and R is the core cyclic peptide of aspartocin.

19. (Original) The antimicrobial sulfonamide derivative of Claim 17 in which S^1 is $-CH_2-CO_2H$, $-CH_2-CH_2-CO_2H$, $-C(OH)H-CONH_2$, $-CH_2-CONH_2$ or $-CH_2-CH_2-CONH_2$ or a salt or hydrate thereof.

20. (Original) The antimicrobial sulfonamide derivative of Claim 17 in which S^1 is $-CH_2$-indol-2-yl or $-CH_2$-phenyl.

21. (Cancelled)

22. (Previously Presented) The antimicrobial sulfonamide derivative of Claim 13 in which L is:



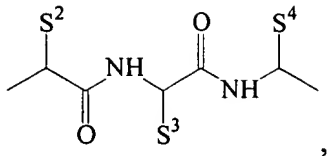
wherein S^2 and S^3 are each independently a side chain of a genetically encoded α-amino acid.

23. (Cancelled)

24. (Original) The antimicrobial sulfonamide derivative of Claim 22 in which S^2 is hydrogen, $-CH_2$-indol-2-yl, $-CH_2-CONH_2$ or $-CH_2-CH_2-CONH_2$ and S^3 is $-CH_2-CO_2H$, $-CH_2-CH_2-CO_2H$ or a salt or hydrate thereof.

25. (Original) The antimicrobial sulfonamide derivative of Claim 22 in which S^2 is $-CH_2-CO_2H$, $-CH_2-CH_2-CO_2H$ or a salt or hydrate thereof and S^3 is $-C(OH)H-CONH_2$.

26. (Previously Presented) The antimicrobial sulfonamide derivative of Claim 13 in which L is:



,

wherein S^2, S^3, and S^4 are each independently a side chain of a genetically encoded α-amino acid.

27. (Cancelled)

28. (Original) The antimicrobial sulfonamide derivative of Claim 26 in which S^2 is -CH_2-indol-2-yl, S^3 is -CH_2.$CONH_2$ or -CH_2-CH_2-$CONH_2$ and S^4 is -CH_2-CO_2H, -CH_2-CH_2-CO_2H or a salt or hydrate thereof.

29. (Currently Amended) The antimicrobial sulfonamide derivative of Claim 26 in which S^2 is -CH_2-indol-2-yl, S^3 is -CH_2-CO_2H, CH_2-CH_2-CO_2H or a salt or hydrate thereof and ~~S4~~ S^4 is -CH_2-$CONH_2$, -CH_2-CH_2-$CONH_2$ or -C(OH)H-$CONH_2$.

30. (Original) The antimicrobial sulfonamide derivative of Claim 4 in which m is 0.

31. (Original) The antimicrobial sulfonamide derivative of Claim 30 in which R^4 is hydrogen.

32. (Previously Presented) The antimicrobial sulfonamide derivative of Claim 30 in which R is the core antibiotic of aspartocin.

33. (Previously Presented) The antimicrobial sulfonamide derivative of Claim 30 in which R is the core cyclic peptide of aspartocin.

34. (Currently Amended) A pharmaceutical composition comprising an antimicrobial sulfonamide derivative according to ~~Claim 4~~ any one of Claims 1 to 5 and a pharmaceutically acceptable adjuvant, excipient, carrier or diluent.

35. (Currently Amended) A method for treating or preventing a microbial infection, said method comprising the step of administering to a subject a therapeutically effective amount of ~~a compound according to Claim 4 or a therapeutically effective amount of a~~ pharmaceutical composition according to Claim 34.

36. (Currently Amended) A method of inhibiting microbial growth, said method comprising the step of administering to a microbe an antimicrobially effective amount of ~~an antimicrobial sulfonamide derivative according to Claim 4 or an antimicrobially effective amount of~~ a pharmaceutical composition according to Claim 34.

37. (Previously Presented) A method for making an antimicrobial sulfonamide derivative comprising sulfonylating a core antibiotic or core cyclic peptide with a lipophilic sulfonyl derivative, thereby providing an antimicrobial sulfonamide derivative.

38. (Currently Amended) The method of Claim 37 in which the lipophilic sulfonyl derivative is ~~a~~ an activated lipophilic sulfonyl ester or a lipophilic sulfonyl halide.

39. (Original) The method of Claim 38 in which the activated lipophilic sulfonyl ester is a lipophilic hydroxybenzotriazole ester.

40. (Previously Presented) The method of Claim 38 in which the lipophilic sulfonyl halide is a lipophilic sulfonyl chloride.

41. (Currently Amended) A method for making an antimicrobial sulfonamide derivative comprising:

sulfonylating a linker with a lipophilic sulfonyl compound, thereby providing a lipophilic sulfonamide linker; and

covalently attaching the lipophilic sulfonamide linker to a core antibiotic or core cyclic peptide wherein said core cyclic peptide or core antibiotic is ~~not of polymyxin~~ of an acidic lipopeptide antibiotic, thereby yielding an antimicrobial sulfonamide derivative.

42. (Previously Presented) A method for making an antimicrobial sulfonamide derivative comprising:

covalently attaching a linker to a core antibiotic or core cyclic peptide, thereby providing an linker core antibiotic or linker core cyclic peptide; and

sulfonylating the linker core antibiotic or linker core cyclic peptide with a lipophilic sulfonyl derivative, thereby yielding an antimicrobial sulfonamide derivative.

43. (New) A method for treating or preventing a microbial infection, said method comprising the step of administering to a subject a therapeutically effective amount of an antimicrobial sulfonamide derivative according to any one of Claims 1 to 5.

44. (New) The method of Claim 43 in which the core cyclic peptide is aspartocin.

45. (New) The method of Claim 43 in which the core antibiotic is aspartocin.

46. (New) A method of inhibiting microbial growth, said method comprising the step of administering to a microbe an antimicrobially effective amount of an antimicrobial sulfonamide derivative according to any one of Claims 1 to 5.

47. (New) The method of Claim 46 in which the core cyclic peptide is aspartocin.

48. (New) The method of Claim 46 in which the core antibiotic is aspartocin.